



Fermilab

# MINERvA Working Group Meeting

January 11 2006

1:00 – 2:30 PM

Snake Pit

# Agenda

- 1) Feedback on interchanges between the Directorate and OHEP [Mont]
- 2) Discuss MINERvA Timeline[Ed/Dean]
- 3) Discussion on Procuring Drip Ceiling for MINOS Hall [Nancy/Debbie]
- 4) 413 Based CDR Development Discussion [Debbie/Nancy/Ed]
- 5) TDR Format Requirements Discussion [Debbie/Nancy/All]
- 6) Discussion of outcome from Directors CD-1 Review and status of actions required for MINERvA to be at CD-1 (i.e. schedule, milestones, bases of estimate, etc.) [Debbie/Nancy]
- 7) Discuss CD-4 Definition (End of Project) [Debbie/Nancy/All]
- 8) Status of CD-1 Documentation [Dave]
- 9) Status of Open Action Items from 23-November meeting: [Debbie/Nancy]

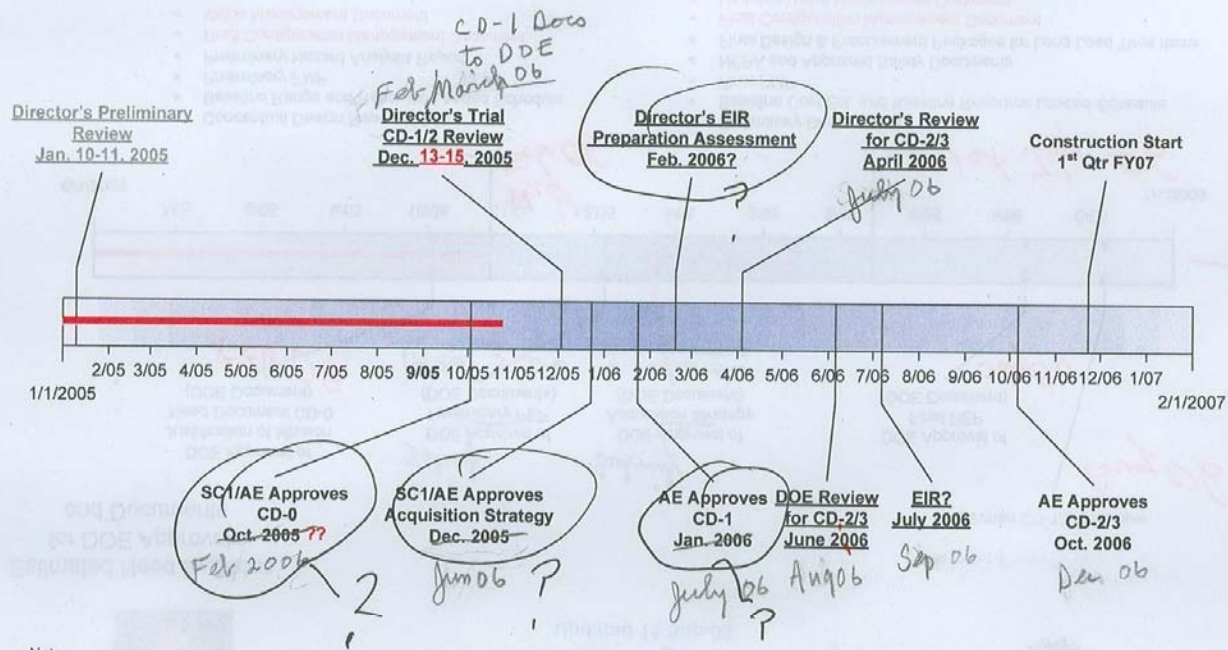


## DRAFT MINERvA Project Timeline for Critical Decisions & Reviews

Updated 24-Oct-05



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Note:  
Items marked in Red indicates change from prior version

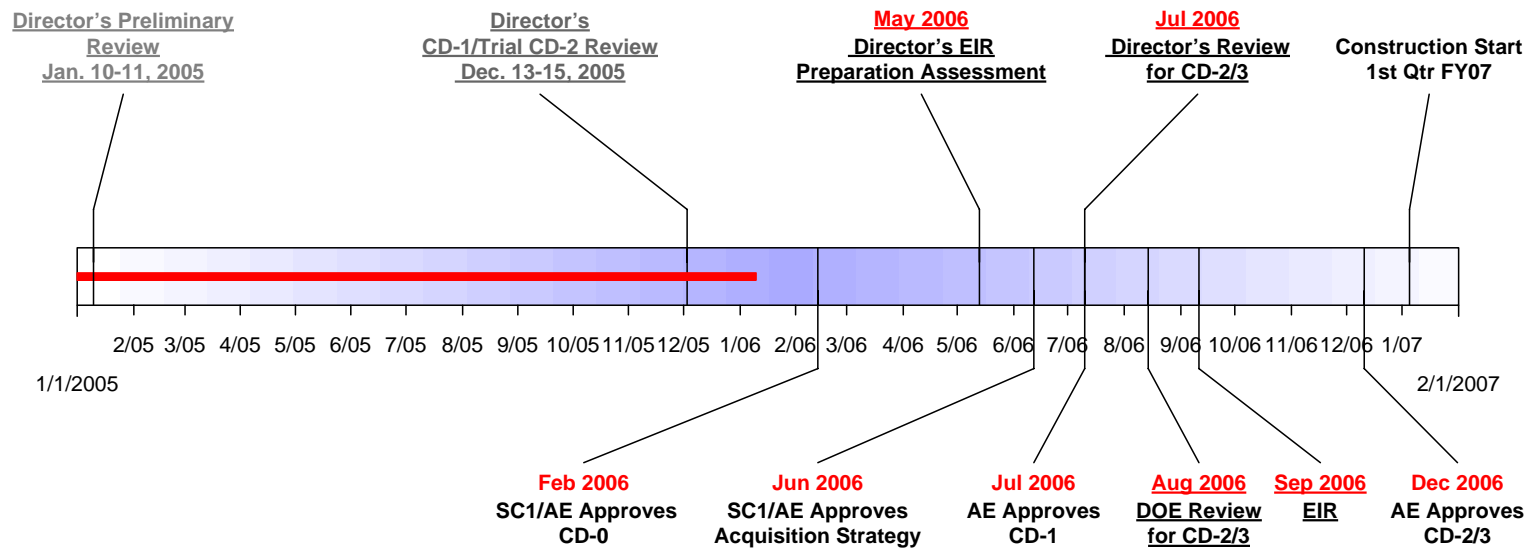


# DRAFT MINERvA Project Timeline for Critical Decisions & Reviews

Updated 10-Jan-06



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Note:  
Items marked in Red indicates change from prior version

11-Jan-06

OPMO Slides for MINERvA  
Working Group Meeting

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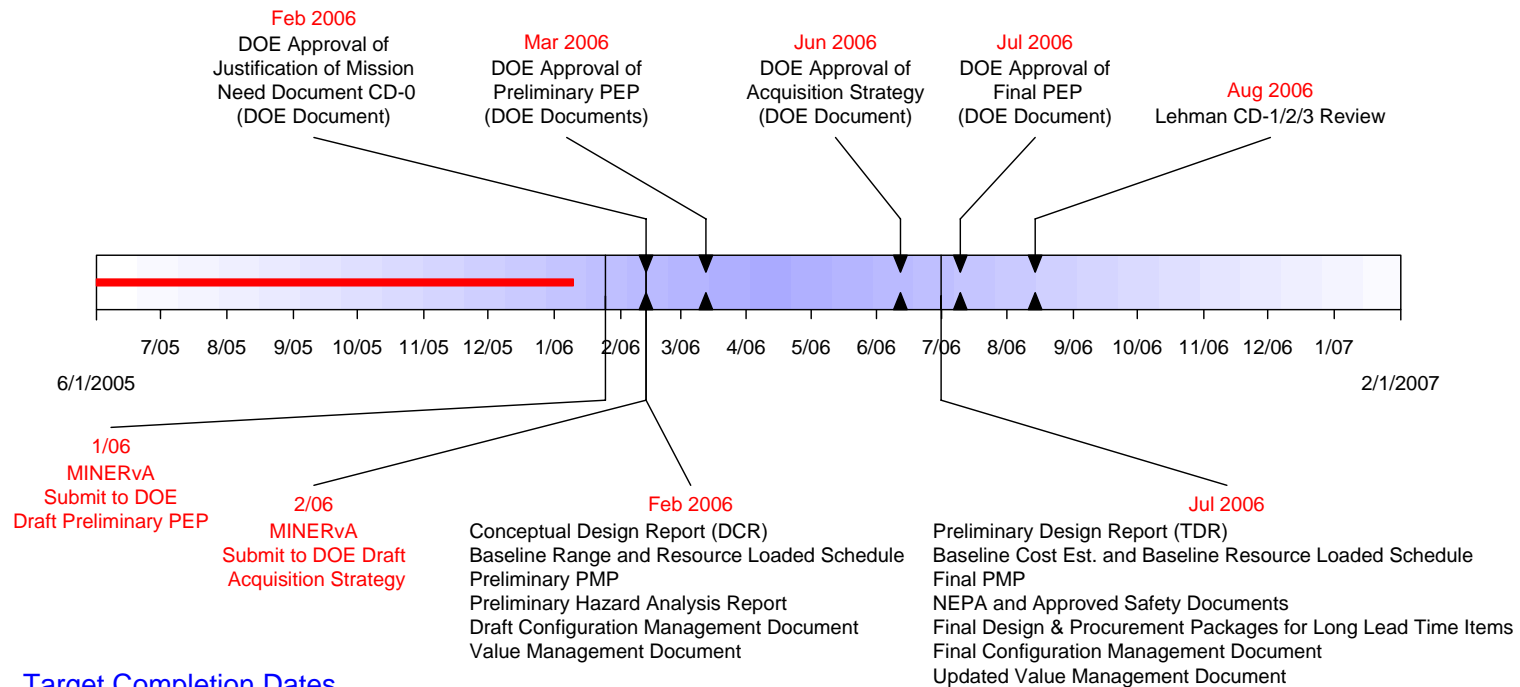
# MINERvA Project

## Draft Critical Design Prerequisites

Updated 10-Jan-06



Estimated Need by Dates  
for DOE Approvals  
and Documents



Target Completion Dates  
for MINERvA Documents

Note:  
Items marked in **Red** indicates change from prior version

# Project Design Phases

R&D

CD-0

~ 5%  
Conceptual Design

CD-1

CDR

~ 30%  
Preliminary Design

CD-2

TDR

100%  
Final Design

CD-3

Bid Package

CD-4

Construction

# Conceptual Design

- Definition from Manual (page A-6)

**Conceptual Design.** The concept for meeting a mission need. The conceptual design process requires a mission need as an input. Concepts for meeting the need are explored and alternatives considered arriving at the set of alternatives that are technically viable, affordable and sustainable.

# Conceptual Design

- Descriptive Paragraph from the Manual (Section 5.2)

## 5.2 CONCEPTUAL DESIGN

The conceptual design effort is dependent on the nature of the need. While it is normal for solutions to quickly present themselves in response to a need, the conceptual design process must be approached methodically to ensure that the arrived at solution or alternatives are not merely responsive to an approved need, but are within the current technology, are affordable, and provide the best value to the Department. Research, development, testing and other efforts may be required that will contribute to the concept. The conceptual design process may also require negotiation with outside organizations, stakeholders or other legal entities to agree on functional, technical, operational requirements, performance requirements or standards. Value management is a key ingredient in the process that supports reaching the lowest cost alternatives. Value management should be employed as early as possible in the project development and design process so recommendations can be included in the planning and implemented without delaying the progress of the project or causing significant rework of completed designs. Value management conducted during the early phases of capital asset acquisition yields the greatest cost reductions.

# Conceptual Design DOE M 413.3

## 5.2.4 Conceptual Design Report

The Conceptual Design Report is developed during the conceptual exploration and design process when the outcome is envisioned as an asset that performs a specific function. When used in this Manual, the Conceptual Design Report refers to the documentation that identifies the requirements and concept for fulfilling those requirements. The Conceptual Design Report is often the first technical document produced during the acquisition process. It is a necessary element in decision making because it presents the results of analysis of requirements, risks, and alternatives to arrive at a recommended solution. The conceptual design or equivalent should clearly and concisely describe the recommended alternative, the requirements and functions that must be performed and the key performance parameters that form the basis of the Performance Baseline. When the purpose of the project is remediation, restoration, or demolishing, other forms of documenting the requirements and alternative(s) may be used.

Common elements of the report may include the following (and other items not listed) as necessary to support the transition from concept to design.

- A description of the recommended alternative (design or characterization) and a synopsis of the development activities. In remediation projects, the report is a combination of applicable regulations and characterization.
- A schedule and cost range (or rough order of magnitude cost) including resources necessary to complete the design and preparation activity. Including identified resources necessary for a Project Engineering Design budget request, when required.
- An alternatives analysis including life-cycle costs, operational considerations, site development considerations, relationships to other site activities, and the comparison of alternatives, the risks, and the determined preferred alternative. Life-cycle costs are to include decontamination and demolition, transition (personnel and equipment moves), utilities, and maintenance including comparisons that incorporate a review of research and development and/or technology development challenges presented by the selected alternative.
- A preliminary Safeguards and Security Plan
- Performance parameters that are responsive to the mission need
- A preliminary Project Execution Plan
- The summary test and acceptance criteria
- The Work Breakdown Structure, which identifies the elements of the end product and dictionary

# Conceptual Design DOE M 413.3 (continued)

- Condition assessments for the facilities, if the project is upgrading existing facilities. These assessments may confirm the suitability of facilities for the proposed action.
- A waste minimization/pollution identification and prevention plan, and a Waste Management Plan including control, storage, treatment, and disposal commensurate with the type of asset and maturity of the planning
- A draft Decontamination and Decommissioning Plan, if required
- Assessments of and strategy for:
  - The National Environmental Policy Act (NEPA). The level of NEPA documentation required and the plan for completing these documents in support of the proposed project schedule.
  - Safety. The level of safety documentation required for the project, and the plan for completing these documents in support of the proposed project schedule. An initial Hazards Assessment and/or Preliminary Safety Analysis.
  - Security Considerations.
  - Site Selection. The application of a coherent, defensible methodology to identify and evaluate site options.
  - Waste Management. Decontamination and decommissioning plans where appropriate and applicable; waste minimization efforts.
- Public and/or stakeholder input
- Preliminary interface control documents
- System requirements and applicable codes and standards for design, procurement, construction, or characterization
- Site selection criteria and site surveys/ evaluations
- Anticipated/project products/deliverables (project end-state)
- Known and anticipated project constraints
- Conceptual design drawings/renderings/calculations
- Readiness assessment or readiness review concepts
- A vulnerability assessment
- A preliminary plan for demobilization and/or disposal of facilities being replaced

# Design Terminology

Circa August 2003

Helen,

I was reading from Attachment 4, Project Acquisition Process and Critical Decisions of the attached pdf document to answer your questions this morning.

Furthermore I suggested the following 1 to 1 correlations

Equipment	Buildings	Design Fraction Complete
Conceptual Design	Conceptual Design	O(5%)
Preliminary Design	Title I	O(30%)
Final Design	Title II	O(100%)
Acceptance	Title III	QA thru Project Completion

On Detector Projects we frequently talk about a Proposal and then a Technical Design Report. Appropriately cast information at the Proposal stage may sometimes be equivalent to a Conceptual Design and the Technical Design Report might correspond to something like the Preliminary Design.

Sincerely,

Ed.

PS: I'm not sure how my table of correlations will come out in the email. I may have to create it in an attached file and resend.

# Design Definitions

Page 6-1 of the Manual DOE M 413.3-1

DOE M 413.3-1 is the Project Management for the Acquisition of Capital Assets manual

## 6.2 PRELIMINARY DESIGN

Evolving the conceptual design into the preliminary design provides the depth and detail to allow the asset to take shape and form. Preliminary design initiates the process of converting concepts to a design appropriate for procurement or construction. This stage of the design is complete when it provides sufficient information to support development of the Performance Baseline. The appropriate completion percentage is dependent upon the project. When the project is less complex, such as a facility repair with single design, the percent complete is generally equivalent to 20 to 35 percent of the total design effort.

For complex projects, the percentage of design may not be definitive because these projects may have many subsystems undergoing concurrent designs that may be at various stages of completion. Scientific systems, such as accelerators and detectors, production and manufacturing facilities, spacecraft and other systems, do not follow a linear process in which all subsystems reach the same maturity at the same time. Concurrency in these types of projects increases the risk because each subsystem design is dependent upon the design maturity of other subsystems.

# Design Definitions (continued)

From the Glossary of the Project Management Practices document

**Preliminary Design.** Continues the design effort utilizing the conceptual design and the project design criteria as a basis for project development. Title I design develops topographical and subsurface data and determines the requirements and criteria that will govern the definitive design. Tasks include preparation of preliminary planning and engineering studies, preliminary drawings and outline specifications, life-cycle cost analysis, preliminary cost estimates, and scheduling for project completion. Preliminary design provides identification of long-lead procurement items and analysis of risks associated with continued project development.

**Conceptual Design.** Conceptual design encompasses those efforts to: (a) develop a project scope that will satisfy program needs; (b) assure project feasibility and attainable performance levels; (c) develop reliable cost estimates and realistic schedules in order to provide a complete description of the project for Congressional consideration; and (d) develop project criteria and design parameters for all engineering disciplines, identification of applicable codes and standards, quality assurance requirements, environmental studies, materials of construction, space allowances, energy conservation features, health safety, safeguards, and security requirements, and any other features or requirements necessary to describe the project.

**Final Design.** This continues the development of the project based on approved preliminary design. Definitive design includes any revisions required of the preliminary effort; preparation of final working drawings, specifications, bidding documents, cost estimates, and coordination with all parties that might affect the project, development of firm construction and procurement schedules; and assistance in analyzing proposals or bids.

# DOE O 413.3 Attachment 4

DOE O 413.3  
10-13-00

Attachment 4  
Page 1

PROJECT ACQUISITION PROCESS AND CRITICAL DECISIONS					
Project Planning Phase		Project Execution Phase			Mission
Preconceptual Planning	Conceptual Design	Preliminary Design	Final Design	Construction	Operations
CD-0	CD-1	CD-2	CD-3	CD-4	
Approve Mission Need	Approve Preliminary Baseline Range	Approve Performance Baseline	Approve Start of Construction	Approve Start of Operations or Project Closeout	
<i>See Page 2 for CDs on Environmental Restoration and Facility Disposition Projects</i>					
CD-0	CD-1	CD-2	CD-3	CD-4	
Actions Authorized by Critical Decision Approval					
<ul style="list-style-type: none"> <li>Proceed with conceptual design using program funds</li> <li>Request PED funding</li> </ul>	<ul style="list-style-type: none"> <li>Allow expenditure of PED funds for design</li> </ul>	<ul style="list-style-type: none"> <li>Establish baseline budget for construction</li> <li>Continue design</li> <li>Request construction funding</li> </ul>	<ul style="list-style-type: none"> <li>Approve expenditure of funds for construction</li> </ul>	<ul style="list-style-type: none"> <li>Allow start of operations or project closeout</li> </ul>	
Critical Decision Prerequisites					
<ul style="list-style-type: none"> <li>Justification of mission need document</li> <li>Acquisition Strategy</li> <li>Preconceptual planning</li> <li>Mission Need Independent Project Review</li> </ul>	<ul style="list-style-type: none"> <li>Acquisition Plan</li> <li>Conceptual Design Report</li> <li>Preliminary Project Execution Plan and baseline range</li> <li>Project Data Sheet for design</li> <li>Verification of mission need</li> <li>Preliminary Hazard Analysis Report</li> </ul>	<ul style="list-style-type: none"> <li>Preliminary design</li> <li>Review of contractor project management system</li> <li>Final Project Execution Plan and performance baseline</li> <li>Independent cost estimate</li> <li>National Environmental Policy Act documentation</li> <li>Project Data Sheet for construction</li> <li>Draft Preliminary Safety Analysis Report</li> <li>Performance Baseline External Independent Review</li> </ul>	<ul style="list-style-type: none"> <li>Update Project Execution Plan and performance baseline</li> <li>Final design and procurement packages (**)</li> <li>Verification of mission need</li> <li>Budget and congressional authorization and appropriation enacted</li> <li>Approval of Safety documentation</li> <li>Execution Readiness Independent Review</li> </ul>	<ul style="list-style-type: none"> <li>Operational Readiness Review and acceptance report</li> <li>Project transition to operations report</li> <li>Final Safety Analysis Report</li> </ul>	
				<b>After CD-4</b> <u>Closeout</u> <ul style="list-style-type: none"> <li>Project closeout report</li> </ul>	

(\*\*) To the degree appropriate to initiate construction as scheduled.

11-Jan-06

OPMO Slides for MINERvA  
Working Group Meeting

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# Action Items

## NEW:

- a) Debbie and Nancy to give Dean a web page to point reviewers to for review (done)
- b) Dean to give Minerva PM the format for the cost summary table (done)
- c) Look for PMT expert to serve on review committee (Peter Shanahan pointed out that Hogan who is on the review committee already is also a PMT expert)
- d) MINERvA PM to put “10-page PowerPoint document that was given to Greg for CD0- documentation” as first link on Director’s review materials.

## OLD:

- e) Someone (?) to send Kevin the CD-0 documentation mission needs for “alternatives considered” document, needed for CD-1.
- f) Debbie/Nancy to formalize configuration management plan. Discussed but still to be documented.